

**WHAT IS CLAIMED IS:**

1           1.     A system for controlling a volume output by a set of headphones to prevent  
2 harmful sound levels from damaging a user's hearing, the system comprising:  
3           a volume sensor/controller for determining sound levels from an audio source and  
4 comparing the predetermined sound levels to a volume threshold; and  
5           a warning indicator for indicating that the determined sound level is outside the volume  
6 threshold.

1           2.     A system for controlling volume output as described in Claim 1, wherein the  
2 determined sound levels are represented as energy functions according to their respective  
3 frequencies.

1           3.     A system as described in Claim 1, wherein the volume sensor/controller  
2 comprises:  
3           a volume calibrator for setting the volume threshold;  
4           a volume/frequency measurement sensor for representing the determined sound levels as  
5 energy functions; and  
6           a comparator for comparing the determined sound levels with the volume threshold and  
7 notifying the warning indicator that the volume threshold has been exceeded.

1           4.     A system as described in Claim 1, wherein the warning indicator is fixed to the  
2 headphones for indicating when the volume threshold has been exceeded.

1           5.     A system as described in Claim 4, wherein the warning indicator comprises a  
2 plurality of LED's.

1           6.     A system as described in Claim 4, wherein the warning indicator comprises an  
2     LCD.

1           7.     A system as described in Claim 4, wherein the warning indicator comprises an  
2     audio indicator.

1           8.     A volume sensor/controller as described in Claim 3, wherein the volume  
2     calibrator comprises:  
3                 a category selector allowing the user to select between different volume controlling  
4     settings matching different user characteristics; and  
5                 a category data base for storing the sound characteristics for the volume controlling  
6     settings.

1           9.     A volume calibrator as described in Claim 8, wherein the category data base  
2     comprises:  
3                 a default user setting;  
4                 an age dependent setting;  
5                 a listener type setting; and  
6                 a manually controlled setting.

1           10.    A category data base as described in Claim 9, wherein the listener type setting is  
2     configured for setting the volume for a user having a form of hearing loss.

1           11.    A system for controlling a volume output by a set of headphones to prevent  
2     harmful sound levels from damaging a user's hearing, the system comprising a volume  
3     sensor/controller for:  
4                 determining sound levels from an audio source;  
5                 comparing the determined sound levels to a volume threshold; and

1 adjusting the volume output of the headphones to a level below the volume threshold if  
2 said determined sound level is above the volume threshold.

1 12. A system for controlling volume output as described in Claim 11, wherein the  
2 determined sound levels are represented as energy functions according to their respective  
3 frequencies.

1 13. A system as described in Claim 11, wherein the volume sensor/controller  
2 comprises:  
3 a volume calibrator for setting the volume threshold and a volume control mode;  
4 a volume/frequency measurement sensor for representing the determined sound levels as  
5 energy functions;  
6 a comparator for comparing the determined sound levels with the volume threshold; and  
7 an active volume controller for controlling the output volume by adjusting the output  
8 volume accordingly in an automatic volume control mode.

1 14. A volume sensor/controller as described in Claim 13, wherein the volume  
2 calibrator comprises:  
3 a volume control mode selector allowing the user to select between an automatic or  
4 manual volume control mode;  
5 a category selector allowing the user to select between different volume controlling  
6 settings matching different user characteristics; and  
8 a category data base for storing the sound characteristics for the volume controlling  
9 settings.

1 15. A volume calibrator as described in Claim 14, wherein the category data base  
2 comprises:  
3 a default user setting;

1 an age dependent setting;  
2 a listener type setting; and  
3 a manually controlled setting.

1 16. A category data base as described in Claim 15, wherein the listener type setting is  
2 configured for setting the volume for a user having a form of hearing loss.

1 17. A volume sensor/controller as described in Claim 13, wherein the active volume  
2 controller comprises:  
3 a volume adjuster for adjusting the volume according to the compared energy value; and  
4 a notifier for notifying the warning system that an adjustment was necessary.

1 18. A system for controlling a volume output to prevent harmful sound levels from  
2 damaging a user's hearing, the system comprising:  
3 a set of headphones;  
4 a volume sensor/controller for determining a sound level corresponding to an audio  
5 source and comparing the sound level to a volume threshold; and  
6 a warning indicator remote from the headphones, in communication with the volume  
7 sensor/controller, for indicating that the determined sound level is above the volume threshold.

1 19. A warning system as described in Claim 18, wherein the warning indicator is  
2 provided by a PC.

1 20. A warning system as described in Claim 19, wherein the PC includes a database  
2 for storing a user's listening history.

1 21. A warning system as described in Claim 18, wherein the warning indicator is  
2 provided on a remote hand held device.

1           22.    A system as described in Claim 18, further comprising wireless connection  
2 hardware for wirelessly connecting the headphones and the audio source.

1           23.    A method for controlling a volume output of a set of headphones to prevent  
2 harmful sound levels from damaging a user hearing, the method comprising:  
3           setting a volume threshold;  
4           receiving audio signals from an audio source;  
5           comparing the audio signals to the volume threshold; and  
6           adjusting a volume output of the compared audio signal to be within the volume  
7 threshold.

1           24.    A method as described in Claim 23, further comprising sending a warning signal  
2 to a warning indicator when the audio signals are determined to be above the volume threshold.

1           25.    A method of sending a warning signal as described in Claim 24, wherein the  
2 warning signal is sent via a network.

1           26.    A method as described in Claim 24, further comprising storing each occurrence of  
2 sending the warning signal in a database.